

Amendments to the Claims

1. (Currently Amended) A method of mixing liquids in microfluidic devices comprising:

(a) dispensing at least a first liquid and a second liquid into a first chamber to form combined liquid;

(b) discharging said combined liquid of (a) from said first chamber into a second chamber via ~~at least one capillary passageway~~ or via two or more separated capillary passageways ~~in liquid communication with said first chamber~~, to complete mixing of said combined liquids.

2. (Currently Amended) A method of mixing liquids of Claim 1 wherein said combined liquid of (a) is discharged into said second chamber through ~~more than one~~ two or more separated capillary passageways.

3. (Currently Amended) A method of mixing liquids of Claim 2 wherein said combined liquid of (a) is discharged into said second chamber through at least ~~[[two]]~~ three separated capillary passageways.

4. (Currently Amended) A method of mixing liquids of Claim 1 wherein said combined liquid discharged into said second chamber ~~[[is in]]~~ is discharged into [liquid communication with] at least a third chamber through ~~at least one capillary passageway~~ or via two or more separated capillary passageways.

5. (Original) A method of Claim 1 wherein said combined liquid of (a) is discharged into said second chamber in the form of droplets.

6. (Original) A method of Claim 1 wherein said first chamber has a volume of at least about twice that of the combined liquid of (a).

7. (Original) A method of Claim 1 wherein said second chamber has a volume of at least about twice that of the combined liquid of (a).

8. (Original) A method of Claim 6 wherein said first chamber has a depth of at least about twice that required to hold the combined volume of (a).

9. (Original) A method of Claim 7 wherein said second chamber has a depth of at least about twice that required to hold the combined volume of (a).

10. (Original) A method of Claim 1 wherein a space of at least 100 μm is above the level of liquid in the first chamber.

11. (Original) A method of Claim 1 wherein a space of at least 100 μm is above the level of liquid in the second chamber.

12. (Currently Amended) A method of Claim 1 wherein said ~~at least one~~ capillary passageways ~~has a~~ have cross-sectional dimensions of 1 to 2000 μm .

13. (Currently Amended) A method of Claim 12 wherein said ~~at least one~~ capillary passageways ~~has a~~ have cross-sectional dimensions of 200 to 1000 μm .

14. (Currently Amended) A method of Claim 1 wherein said ~~at least one~~ capillary passageways ~~has a~~ have lengths of 0.5 to 100 mm.

15. (Currently Amended) A method of Claim 14 wherein said ~~at least one~~ capillary passageways ~~has a~~ have lengths of 1 to 50 mm.

16. (Currently Amended) A method of Claim [[1]] 3 wherein three or more separated capillary passageways are in liquid communication between said first and second chambers.

17. (Original) A method of Claim 1 wherein at least one of said first and second chambers contains steps or ramps to assist mixing of said combined liquids.

18. (Currently Amended) A method of Claim 1 wherein ~~the velocity of~~ said combined liquids of (a) in said at least one capillary passageway ~~[[is]]~~ are discharged with a velocity of at least 1 mm/sec.

19. (Original) A method of Claim 1 wherein said first and second liquids are dispensed from wells into said first chamber through capillary passageways.

20. (Currently Amended) A method of Claim 1 wherein the completely mixed combined liquids are ~~completely mixed and~~ thereafter moved to downstream chambers for further processing.

21. (Currently Amended) A microfluidic device comprising:

(a) a first chamber for receiving and combining at least a first liquid and a second liquid;

(b) a second chamber for complete mixing of said at least first and second liquids, said second chamber being in liquid communication with said first chamber via ~~at least one capillary passageway~~ or via two or more separated passageways.

22. (Currently Amended) A microfluidic device of Claim 21 wherein said first and second chambers are in liquid communication through ~~more than one~~ two or more separated capillary passageways.

23. (Currently Amended) A microfluidic of Claim 22 wherein said first and second chambers are in liquid communication through at least ~~[[two]]~~ three separated capillary passageways.

24. (Currently Amended) A microfluidic device of Claim 21 wherein said second chamber is in liquid communication with at least a third chamber through ~~at least one capillary passageway~~ or two or more separated capillary passageways.

25. (Currently Amended) A microfluidic device of Claim 21 wherein said first chamber has a volume of at least about twice that of the combined volume of said first and second ~~containers~~ liquids.

26. (Currently Amended) A microfluidic device of Claim 21 wherein said second chamber has a volume of at least about twice that of the combined volume of said first and second ~~containers~~ liquids.

27. (Currently Amended) A microfluidic device of Claim 25 wherein said first chamber has a depth of at least about twice the required to hold the combined volume of said first and second ~~containers~~ liquids.

28. (Currently Amended) A microfluidic device of Claim 26 wherein said second chamber has a depth of at least about twice that required to hold the combined volume of said first and second ~~containers~~ liquids.

29. (Currently Amended) A microfluidic device of Claim 21 wherein a space of at least 100 μm is above the level of said combined first liquid and second liquid in the first chamber.

30. (Currently Amended) A microfluidic device of Claim 21 wherein a space of at least 100 μm is above the level of said combined first liquid and second liquid in the second chamber.

31. (Currently Amended) A microfluidic device of Claim 21 wherein said ~~at least one~~ capillary passageways ~~has a~~ have cross-sectional dimensions of 1 to 2000 μm .

32. (Currently Amended) A microfluidic device of Claim 31 wherein said ~~at least one~~ capillary passageways ~~has a~~ have cross-sectional dimensions of 200 to 1000 μm .

33. (Currently Amended) A microfluidic device of Claim 21 wherein said ~~at least one~~ capillary passageways ~~has a~~ have lengths of 0.5 to 100 mm.

34. (Currently Amended) A microfluidic device of Claim 33 wherein said ~~at least one~~ capillary passageways ~~has a~~ have lengths of 1 to 50 mm.

35. (Currently Amended) A microfluidic device of Claim 21 wherein three or more separated capillary passageways are in liquid communication between said first and second chambers.

36. Canceled.

37. (Currently Amended) A microfluidic device of Claim 21 wherein at least one of said first and second chambers contains microstructures ~~steps or ramps~~ to assist mixing or removal of said first and second liquids.

38. (Original) A microfluidic device of Claim 21 wherein said first chamber is in liquid communication through capillary passageways with wells containing said at least first and second liquids.

39. (Original) A microfluidic device of Claim 21 wherein said second chamber contains means for preventing premature movement of said liquids before mixing is complete.

40. (New) A microfluidic device of Claim 22 wherein said two or more capillary passageways have different diameters.

41. (New) A microfluidic device of Claim 22 wherein said two or more capillary passageways are disposed so as to cause liquid streams or droplets exiting from said passageways to impinge as said liquid streams or droplets enter said second chamber.

42. (New) A microfluidic device of Claim 22 wherein said two or more capillary passageways are manifolded before entering said second chamber.

43. (New) A microfluidic device of Claim 21 wherein said passageways have hydrophilic surfaces.